

FD3051S Monocrystalline Silicon Differential Pressure Transmitter

◆ Product Selection Guide

FD3051S LD-Remote Seal Differential Pressure Transmitter

FD3051S LD Remote Seal Differential Pressure Transmitter

Product Introduction

The remote seal differential pressure transmitter FD3051S LD is suitable to measure liquid, gas, or steam flow as well as liquid level, density and pressure. FD3051S LD outputs a 4~20mADC signal corresponding to the measured differential pressure. Its highly accurate and stable sensor can also measure the static pressure which can be shown on the integral indicator or remotely monitored via HART communications. Other key features include quick response, remote set-up using communications, self-diagnostics and optional status output for pressure high/low alarm. The range limits is 0—1kPa ~ 2MPa, The flange's working pressure are 1.6/4MPa, 6.4MPa, 10MPa, 150psi, 300psi or 600psi.



Technical Parameter

Span code, Measuring range and SWP

| Code | Measuring range Min | Measuring range Max | SWP(Max) |
|------|---------------------|---------------------|-------------------------------|
| B | 1kPa | 6kPa | The flange's working pressure |
| C | 4kPa | 40kPa | |
| D | 25kPa | 250kPa | |
| F | 200kPa | 3MPa | |

Measuring Range

Lower range value: -100% to +100% of the URL(continuously adjustable)

Upper range value: Up to 100% of the URL(continuously adjustable)

Output Signal

Two wire 4~20mADC output with digital communications, linear or square root programmable.

HART FSK protocol are superimposed on the 4~20 mADC

Output range: I_{min}=3.9mA, I_{max}=20.5mA

Failure Alarm (the mode can be selected)

Low Mode (min): 3.7 mA,

High Mode (max): 21 mA

No Mode (hold): Keep the effective value before the fault.

Note: The standard setting of failure alarm is High Mode.

Response Time

The amplifier damping constant is 0.1 sec;

The sensor and flange's damping constant is 0.2~3 sec, it depends on the range and range compression ratio.

Amplifier damping time constant is adjustable from 0.1 to 60 sec by software and added to response time.

Installation Conditions

The transmitter body can be directly fixed in any position.

The best state is to make the process flange axis in a vertical state, and the position deviation will produce a correctable zero offset. the capillary component and remote flange

should only be installed in the same ambient temperature.

The minimum bending radius of the capillary tube is 75mm, and winding is strictly prohibited!

Technical Parameter

Ambient temperature

Min: depends on the fill fluid Max: 85°C

-20 ~ 65°C ,with LCD indicator

-40°C~70°C (OLED indicator)

Storage temperature/transport temperature

Min: depends on the fill fluid Max: 85°C

Humidity:

0 ~ 100%

Shock resistant

Acceleration: 50g

Duration: 11ms

Vibration resistance

500Hz on 2g

Electromagnetic Compatibility (EMC)

See the EMC Performance Table

Temperature limits:

-30 ~ 400°C

Fill fluid, temperature limits and working pressure range

See 《fill fluid, temperature limits and working pressure range》 Table

Pressure limits

From 3.5kPa abs. to working pressure. Proof pressure up to

1.5-times the nominal pressure simultaneously on both sides of the transmitter admissible.

Flange working pressure

ANSI: 150psi ~ 600psi

DIN: PN 1.6MPa ~ PN 10MPa

One-sided overload:

One-sided overload up to the rated pressure.

Possibly occurring zero offsets can be corrected.

Explosion Protected Type

NEPSI / ATEX: Ex d II C T6

NEPSI / ATEX: Ex ia II C T4

Amb. Temp.: -40°C ~65°C



FD3051S Monocrystalline Silicon Differential Pressure Transmitter

◆ Product Selection Guide

FD3051S LD-Remote Seal Differential Pressure Transmitter

Technical Parameter

Supply & Load Requirements

| |
|---|
| 24VDC supply, R=520Ω |
| $R \leq (U_s - 12V) / I_{max}$ kΩ, $I_{max} = 23mA$ |
| Power 15~36V DC |
| R Working: 0~1040Ω |
| Digital communication 230Ω to 600Ω |

Electrical Connection

M20X1.5 cable entry, suitable for 0.5 ~ 2.5mm² wire

Process Connection

Flange with fixing thread 7/16~20 UNF.
The flange comply with the ANSI standard or DIN standards.
See Table

Degrees of Protection

IP67

Technical Parameter

Process Material:

| | |
|----------------|---|
| Sensor Body | 316L stainless steel |
| Isolating | 316L stainless steel / Hastelloy C/Gold plated on |
| Diaphragm | 316L/FEP plated on 316L/Tantalum |
| Process Flange | 304 stainless steel |
| Fill fluid | Silicone oil/ High Temp. Silicone oil/Vegetable oil |
| Housing Gasket | (NBR), (FKM), (PTFE) |
| Housing | Aluminum with epoxy resin coat |
| Gasket | Perbunan (NBR) |
| Name plate | 304 stainless steel |

Weight

| | | |
|----------------------|---------------------|--------|
| One flange: DN 50/2" | 7~10kg, DN 80/3" | 8~11kg |
| DN 4" | 9~12kg; | |
| Two flange: DN 50/2" | 10~16.5kg, DN 80/3" | |
| 12~18kg, DN 4" | 14~21kg。 | |

EMC Performance Table

| Items | Test items | Basic standards | Test conditions | Performance Level |
|-------|---|-------------------|--|-------------------|
| 1 | Radiated interference (Housing) | GB/T 9254-2008 | 30MHz ~ 1000MHz | OK |
| 2 | Conducted interference (DC power port) | GB/T 9254-2008 | 0.15MHz ~ 30MHz | OK |
| 3 | Electrostatic Discharge (ESD) Immunity | GB/T 17626.2-2006 | 4kV(line) 8kV(air) | B |
| 4 | RF electromagnetic field immunity | GB/T 17626.3-2006 | 10V/m (80MHz ~ 1GHz) | A |
| 5 | Frequency magnetic field immunity | GB/T 17626.8-2006 | 30A/m | A |
| 6 | Electrical Fast Transient Burst Immunity | GB/T 17626.4-2008 | 2kV(5/50ns,5kHz) | B |
| 7 | Surge Immunity | GB/T 17626.5-2008 | 1kV (line to line) 2kV (line to ground) (1.2us/50us) | B |
| 8 | Conducted interference immunity induced by RF field | GB/T 17626.6-2008 | 3V (150KHz ~ 80MHz) | A |

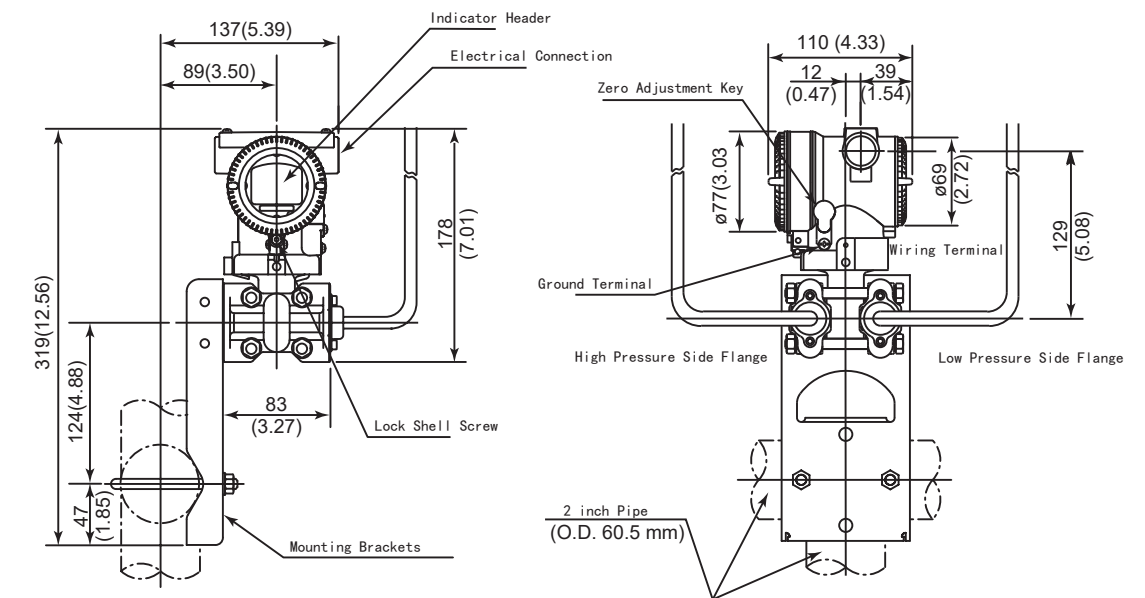
Note: (1) Performance level A description: The technical specifications within the limits of normal performance.
(2) Performance level B description: Temporary reduction or loss of functionality or performance, it can restore itself. The actual operating conditions, storage, and data will not be changed.

FD3051S Monocrystalline Silicon Differential Pressure Transmitter

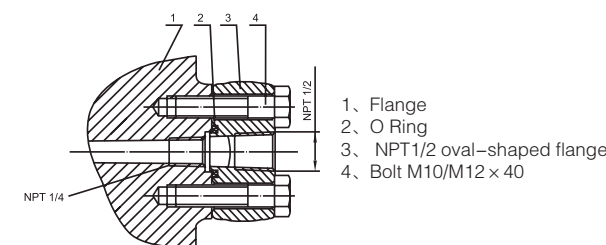
◆ Product Selection Guide

FD3051S LD-Remote Seal Differential Pressure Transmitter

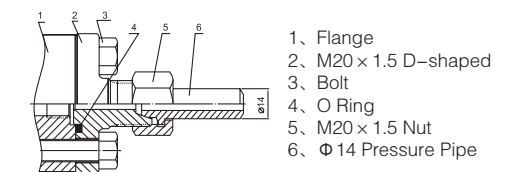
Product Dimensions



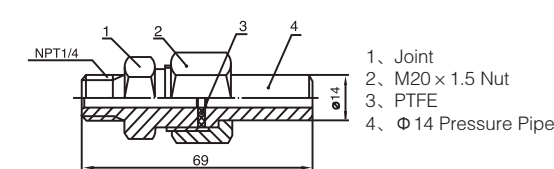
Process Connection Description One side flange



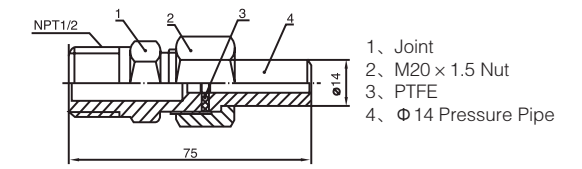
NPT1/2 oval-shaped flange (Code C1)



M20 x 1.5 D-shaped connector (Code C2)



NPT1/4-M20 x 1.5 Adapter (Code C3)



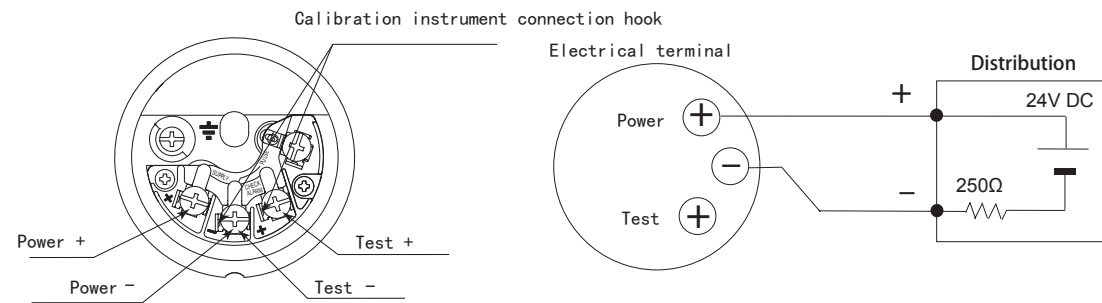
NPT1/2-M20 x 1.5 Adapter (Code C4)

FD3051S Monocrystalline Silicon Differential Pressure Transmitter

◆ Product Selection Guide

FD3051S LD-Remote Seal Differential Pressure Transmitter

Electrical Connection



Model and suffix codes 1 Flange sealing device selection of the remote seal differential pressure transmitter

| Model | Suffix code | Description |
|-----------------------------------|-------------|---|
| FD3051S LD1- | | Single flange remote transmitter |
| FD3051S LD2- | | Double flange remote transmitter |
| Accuracy | B | Intrinsic error ±0.075% |
| | C | Intrinsic error ±0.1% |
| Measuring range | B | 0-1kPa ~ 6kPa |
| | C | 0-4kPa ~ 40kPa |
| | D | 0-25kPa ~ 250kPa |
| | F | 0-200kPa ~ 3MPa |
| Static pressure transducer | 0 | None |
| | 2 | 10MPa |
| Diaphragm material filling fluid | A | 316L stainless steel Silicon oil |
| Rating working pressure | 1 | 16MPa |
| Low pressure side relief valve | N | None |
| | B | The relief valve is installed on the rear end face of the flange (only single flange) |
| Transmitter body sealing material | N | Nitrile rubber (NBR) |
| | F | Fluororubber (FKM) |
| | P | Polytetrafluoroethylene(PTFE) |
| Special function | N | None |
| | O | Oil-free treatment (oxygen measurement limit fluorine oil filling liquid, fluorine rubber sealing ring, <6MPa, <60 °C) |
| | P | Lightning protection |
| Mounting brackets | N | None |
| | 1 | Stainless steel |
| | 2 | Galvanized carbon steel |

Next Page

FD3051S Monocrystalline Silicon Differential Pressure Transmitter

◆ Product Selection Guide

FD3051S LD-Remote Seal Differential Pressure Transmitter

Model and suffix codes 1 Flange sealing device selection of the remote seal differential pressure transmitter

Last Page

| Model | Suffix code | Description |
|--|-------------|--|
| Low-pressure side process connection accessories | N | No process connection accessories (double flange) / 1/4 inch NPT internal thread (single flange) |
| | C1 | 1/2 inch NPT internal thread stainless steel oval flange |
| | C2 | M20x1.5 external thread stainless steel T-shaped joint with M20X1.5 to φ 14 welded pipe |
| | C3 | NPT1 / 4-M20 × 1.5 adapter, with φ 14 welded pipe |
| | C4 | NPT1 / 4-M20 × 1.5 adapter, with φ 14 welded pipe |
| Electrical connection | E | Standard product ISO M20 × 1.5 internal thread |
| | A | ANSI NPT1/2(F) internal thread |
| LCD | L | Liquid crystal display (-20°C) |
| | S | Low temperature LCD display (-30°C) |
| | E | OLED display (-40°C) |
| Explosion-proof option | N | Fundamental form |
| | i | Intrinsic safety type NEPSI |
| | d | Flame-proof type NEPSI |
| Number sign | N | None |
| | 1 | Number sign is on the nameplate |
| | 2 | Hanging stainless steel sign |
| Manual | C | Chinese |
| | E | English |

Remote seal device range capillary length table

| Remote seal flange device | Nominal diameter | Minimum range | | | | | | Maximum capillary length at minimum range | Maximum capillary length |
|--------------------------------|--------------------|--|-------------|--------------------|---|-------------|--------------------|---|--------------------------|
| | | Differential pressure remote transmission isolation diaphragm material | | | Gage pressure/Absolute pressure remote isolation diaphragm material | | | | |
| | | 316L | Hastelloy C | Tantalum/Paintcoat | 316L | Hastelloy C | Tantalum/Paintcoat | | |
| FFW Flat flange PFWFlat flange | DN25/DN1* Only FFW | 15kPa | 20kPa | / | 20kPa | 30kPa | / | 3m | 6m |
| | DN50/DN2* | 8kPa | 12kPa | 20kPa | 12kPa | 15kPa | 20kPa | 3m | 8m |
| | DN80/DN3* | 4kPa | 6kPa | 12kPa | 8kPa | 10kPa | 15kPa | 3m | 11m |
| | DN100/DN4* | 4kPa | 5kPa | 10kPa | 6kPa | 8kPa | 12kPa | 3m | 11m |
| EFW plug-in flange | DN50/DN2* | 8kPa | 12kPa | 20kPa | 15kPa | 20kPa | 20kPa | 3m | 8m |
| | DN80/DN3* | 4kPa | 6kPa | 12kPa | 10kPa | 12kPa | 15kPa | 3m | 11m |
| | DN100/DN4* | 4kPa | 5kPa | 10kPa | 8kPa | 10kPa | 12kPa | 3m | 11m |
| RTW Threaded mount flange | DN50/DN2* | 5kPa | 7kPa | / | 10kPa | 12kPa | / | 3m | 8m |





Note: The minimum range of the remote transmitter should be the larger of the minimum range of this table and sensor range.

FD3051S Monocrystalline Silicon Differential Pressure Transmitter

◆ Product Selection Guide

FD3051S LD-Remote Seal Differential Pressure Transmitter

Remote transmission device selection guide

| | | | | |
|--|--|---|--|--|
| Picture |  |  |  |  |
| Seal type | FFW Flat type remote transmission device | EFW plug-in type remote transmission device | RTW Screw-mounted remote transmission device | PFW Flat type remote transmission device |
| Application | General application | Thermal insulation process | High temperature applications, threaded connection | General application |
| Process connection size | 2 inch DN50 3 inch DN80 4 inch | 2 inch DN50 3 inch DN80 4 inch | NPT1/2 taper pipe thread | 2 inch DN50 3 inch DN80 4 inch |
| Flange pressure rating | PN1.6/4MPa Class 150 PN 6.4MPa Class 300 PN 10MPa Class 600 | PN1.6/4MPa Class 150 PN 6.4MPa Class 300 PN 10MPa Class 600 | Class 1500 Class 2000 Class 5000 Class 10000 | PN1.6/4MPa Class 150 PN 6.4MPa Class 300 PN 10MPa Class 600 |
| Material of diaphragm and wetted parts | 316L stainless steel Hastelloy C Tantalum, Monel | 316L stainless steel Hastelloy C | 316L stainless steel Hastelloy C Tantalum | 316L stainless steel Hastelloy C Tantalum, Monel |
| Option | FEP plated on 316L PFA plated on 316L The diaphragm is attached to the PTFE membrane | FEP plated on 316L PFA plated on 316L | None | FEP plated on 316L PFA plated on 316L The diaphragm is attached to the PTFE membrane |

Filling fluid, working temperature and minimum working static pressure relation table

| Filling fluid | Density 25°C | operating temperature range | Operating static pressure range at different temperatures (kPa absolute pressure) | | | | | | |
|--|--------------|-----------------------------|---|-------|-------|-------|-------|-------|-------|
| | | | 20°C | 100°C | 150°C | 200°C | 250°C | 350°C | 400°C |
| Silicon oil (S) | 960kg/m3 | -30~200°C | >10 | >25 | >50 | >75 | | | |
| High temperature silicon oil (H) | 980kg/m3 | -10~350°C | >10 | >25 | >50 | >75 | >100 | >100 | |
| Ultra high temperature silicone oil(U) | 1020kg/m3 | -10~400°C | >10 | >25 | >50 | >75 | >100 | >100 | >100 |
| Vegetable oil (V) | 937kg/m3 | 0~250°C | >25 | >50 | >75 | >100 | >100 | | |

FD3051S Monocrystalline Silicon Differential Pressure Transmitter

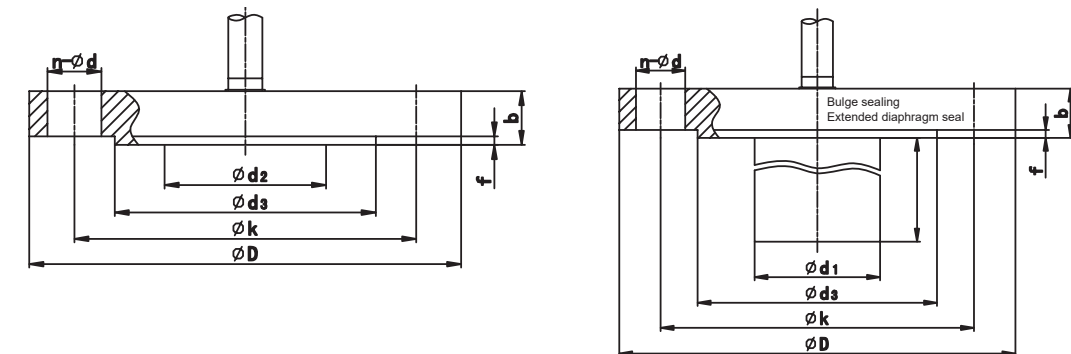
◆ Product Selection Guide

FD3051S LD-Remote Seal Differential Pressure Transmitter

FFW Flat Type / EFW Plug-in type remote transmission device



FFW Flat Type / EFW Plug-in type remote transmission device outline dimension



FFW Flat type / EFW Plug-in type remote transmission device outline dimension table

| Nominal diameter | Rated pressure | ϕD | ϕK | ϕd_1 Plug-in | ϕd_2 Flat-type | ϕd_3 | f | b | For bolt | |
|---|----------------|----------|----------|-----------------------|-------------------------|------------|-------------------|-------|----------|-----|
| | | | | | | | | | Quantity | |
| DN 50 (Sealing surface DIN 2526E) (Flange DIN 2501) | PN1.6/4MPa | 165 | 125 | 48.3 | 57 | 102 | 3 ^{+0.5} | 20 | 4 | M16 |
| | PN 6.4MPa | 180 | 135 | 48.3 | 57 | 102 | 3 ^{+0.5} | 26 | 4 | M20 |
| | PN 10MPa | 195 | 145 | 48.3 | 57 | 102 | 3 ^{+0.5} | 28 | 4 | M20 |
| DN 80 (Sealing surface DIN 2526E) (Flange DIN 2501) | PN1.6/4MPa | 200 | 160 | 76 | 75 | 138 | 3 ^{+0.5} | 24 | 8 | M16 |
| | PN 6.4MPa | 215 | 170 | 76 | 75 | 138 | 3 ^{+0.5} | 28 | 8 | M20 |
| | PN 10MPa | 230 | 180 | 76 | 75 | 138 | 3 ^{+0.5} | 32 | 8 | M24 |
| DN 2" (ANSI B 16.5 RF) | 150psi | 152.4 | 120.6 | 48.3 | 57 | 92.1 | 3 ^{+0.5} | 17.4 | 4 | M18 |
| | 300psi | 165.1 | 127.0 | 48.3 | 57 | 92.1 | 3 ^{+0.5} | 20.6 | 8 | M18 |
| | 600psi | 165.1 | 127.0 | 48.3 | 57 | 92.1 | 6.35 | 31.75 | 8 | M18 |
| DN 3" (ANSI B 16.5 RF) | 150psi | 190.5 | 152.4 | 76 | 75 | 127 | 3 ^{+0.5} | 22.2 | 4 | M16 |
| | 300psi | 209.5 | 168.3 | 76 | 75 | 127 | 3 ^{+0.5} | 27.0 | 8 | M20 |
| | 600psi | 209.5 | 168.3 | 76 | 75 | 127 | 6.35 | 38.05 | 8 | M20 |
| DN 4 " (ANSI B 16.5 RF) | 150psi | 229 | 191 | 89 | 89 | 157 | 3 ^{+0.5} | 30 | 8 | M18 |
| | 300psi | 255 | 200 | 89 | 89 | 157 | 3 ^{+0.5} | 32 | 8 | M18 |